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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,791	06/14/2006	Laurent Pain	292393US2PCT	5941
22850 7590 02/04/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
TRAN, BINH X				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
02/04/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/582,791

**Applicant(s)**

PAIN, LAURENT

**Examiner**

Binh X. Tran

**Art Unit**

1792

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 27-42 and 46-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 53-59 is/are allowed.
- 6) ☒ Claim(s) 27-30, 32-34, 40-42, 46-52, 60 and 61 is/are rejected.
- 7) ☒ Claim(s) 31 and 35-39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01-21-2009 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 27-30, 32, 40-42, 46-50, 60-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangat et al. (US 2003/0039923) in view of Pierrat (US 2004/0081896) .

Respect to claim 27, 60-61, Mangat disclose a correction method for correction an erroneous design made in a first thin layer (40, 55) including at least one first engraved sub-layer (55) including the erroneous design and at least one second sub-layer (40) located between a substrate and the first sub-layer (55) (See Fig 4, paragraph 0019-0020), the method comprising:

depositing a second thin layer (70) covering the first thin layer (55, 40) (see Fig 5, paragraph 0021);

etching the second sub-layer (40) through the first sub-layer (55) (Fig 6 paragraph 0022).

Mangat fails to disclose engraving or lithography of the second thin layer, as a function of desired corrections. In a method for mask repair, Pierrat discloses depositing a second thin film layer (108 or 201) on the first thin film layer (102A) (See Fig 1C, 2A, paragraph 0031, 0035); engraving or lithography in the second thin layer (108) as a function of designed corrections in order to eliminate isolate defects and significantly reduce the size of the defects proximate to the desired shapes on the mask (Fig 1D, 1E, 2B, 2C, paragraph 0031-0032, 0036-0037, Fig 5 step 507-508, abstract). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Mangat in view of Pierrat by engraving or lithography the second thin film because it helps to eliminate isolate defects and significantly reduce the size of the defects proximate to the desired shapes on the mask.

Respect to claims 60, Mangat further discloses the step of depositing the second thin layer (70) on the first thin layer (55, 40) is performed such that the second thin layer (70) cover at least a portion of the first sub-layer (55) thereby covering the erroneous design (i.e. defects) (See Fig 5, paragraph 0051). Respect to claim 61, Mangat disclose the erroneous design (defects) comprises a plurality of erroneous patterns, each erroneous pattern being an erroneous presence or an erroneous absence of a hole (opening) in the first sub-layer (55), wherein the step of deposit the second thin layer

(70) is performed such that the second thin layer (70) covers the plurality of erroneous designs in the first sub-layer (paragraph 0021, fig 5)

Respect to claim 28, both Mangat and Pierrat disclose the desired corrections including an addition of several patterns (Mangat's Fig 5-6, Pierrat's fig 1D-1E). Respect to claim 29, Pierrat discloses several patterns are missing and the lithography including reproduce in the second thin layer (108) of the missing patterns ( Pierrat's Fig 1D-1E).

Respect to claim 30, Pierrat discloses etching the first sub layer (107) through the second thin layer (108A) after the lithography step (See Fig 1D-1F). The step of etching the second sub-layer has been discussed above under Mangat's reference (Fig 6, paragraph 0022).

Respect to claim 32, both Mangat and Pierrat disclose the correction including removing several patterns (Mangat's Fig 5-6; Pierrat's Fig 1E-1F). Respect to claim 40, Mangat discloses removing the first sub-layer (50/55) after the etching of the second-sublayer (40) through the first layer (Fig 5-6, paragraph 0022). Respect to claim 41, Mangat discloses the first sub-layer (50) is based on a conductive material (i.e. tantalum containing material) and the second sub-layer (40) comprises insulating or semiconductor material (silicon oxynitride) (paragraph 0018). Respect to claim 42, Mangat discloses the first sub-layer (55) is a sacrificial layer (See fig 5-6, layer 55 is completely removed). Respect to claims 46-47, both Mangat and Pierrat disclose the second thin film layer is a photoresist layer (read on "a dielectric layer" or "resin or

polymer layer"). Respect to claims 48-50, Pierrat discloses the lithography is carried by direct writing using UV beam, x-ray (paragraph 0054).

4. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangat and Pierrat as applied to claims 27-30, 32, 40-42, 46-50, 60-61 above, and further in view of Fisch et al. (US 6,777,137).

Respect to claim 33, Mangat and Pierrat fail to disclose the engraving or lithography in the second thin layer leaving one or more blocks filling the patterns in excess. Fisch teaches to fill the excess pattern (124, 224) during lithography or engraving process in order to fix the defect (col. 7-10, Fig 1C-1E, Fig 2B-2E). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Mangat and Pierrat in view of Fisch by filling the patterns in excess because it helps to eliminate or reduce the clear defect.

Respect to claim 34, Mangat and Pierrat teaches the correction including adding one or more missing patterns. Fisch teaches to eliminate one or more patterns in excess (124, 224) using the fill material. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Mangat and Pierrat in view of Fisch by eliminate one or more other patterns in excess because helps to eliminate or reduce the clear defect.

5. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mangat and Pierrat as applied to claims 27-30, 32, 40-42, 46-50, 60-61 above, and further in view of Liang et al. (US 2005/0109278 A1).

Respect to claim 51, Mangat and Pierrat fails to disclose the beam being controlled by a digital device associated with a data medium including data relative to the erroneous design and to a desired corrected design. Liang teaches that the beam being control by a system control (i.e. digital device) associated with a data medium (data management module) including data relative to the erroneous designs and a desired corrected designs (Fig 2, paragraph 0020-0022). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Pierrat in view of Liang by using a digital device associated with a data medium to control the beam because it helps to locate and repair the defects.

6. Claims 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangat and Pierrat as applied to claims 27-30, 32, 40-42, 46-50, 60-61 above, and further in view of Stewart et al. (US 2004/0151991).

Respect to claim 51, Pierrat fails to disclose the beam being controlled by a digital device associated with a data medium including data relative to the erroneous design and to a desired corrected design. Stewart that the beam being control by a system controller (36) (i.e. digital device) associated with a data medium (38) including data relative to the erroneous design and a desired corrected design (Fig 1, fig 3, paragraph 0045-0049). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Mangat and Pierrat in view of Stewart by using a digital device associated with a data medium to control the beam because it helps to determine and repair the defects.

Respect to claim 52, Mangat discloses a first means (laser 110) for producing at least one of lithography beam (Fig 8). However, Mangat and Pierrat fail to disclose a second means and a third means. In an photolithography apparatus, Stewart teaches a second means (38) for processing data relative to an erroneous design (i.e. defect) formed in a thin layer and data relative to desired corrected design, and for producing correction data following such process; and a third means (36 or 45) for controlling the first means (ion beam), from correction data produced by the second means (38) (Fig 1, Fig 3, paragraph 0045-0049). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Mangat and Pierrat in view of Stewart by having a second and third means because it helps to determine the defects and repair the defects.

#### ***Allowable Subject Matter***

7. Claims 31, 35-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. Claims 53-59 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter: The reasons for allowance were discussed in previous office action.

#### ***Response to Arguments***

10. Upon further consideration, the examiner decides to withdraw the previous allowable subject matter of claim 60-61. Ground of rejections for claims 60-61 are discussed above.



Respect to claim 27, the applicants state "Neither Mangat et al. nor Pierrat discloses the possibility of making several corrections at the same time. On the contrary, Mangat et al. discloses a correction done with a localized deposition of a single metal block (70). With such a localized deposition, it is not possible to proceed to several corrections at the same time". The examiner disagrees. First, in paragraph 0021, Mangat states "The patterned repairable layer 55 is compared to a desired pattern to determine if any portions of the patterned repairable layer 55 are undesirably added or missing. If any defects are found, the patterned repairable layer 55 is repaired by either removing portions of the patterned repairable layer 55 or adding a metal 70" (emphasis added). It is clear from paragraph 0021, that Mangat refers the "defects" and undesirable portions in plural. Therefore, it is possible to proceed to several corrections (i.e. defects or undesirable portions) at the same time. Further, Figure 5 of Mangat is a single cross-section of the substrate. A whole substrate comprises a plurality of cross-section wherein the plurality of patterns in Figure 5 is repeatable.

The applicants further state "Pierrat does not disclose a step of etching a second sub-layer situated under a first sub-layer comprising several defects. The Pierrat reference fails to suggest making several corrections at the same time in a layer". The examiner strongly disagrees. In the abstract, Pierrat clearly use the term "defects" in plural many times. Further, Pierrat clearly use the term "defect locations" (plural) and "defects" (plural) in paragraph 0053 and claim 12 and 15. Further, Figure 1A-1F, Fig 2A-1F, Fig 3-4 of Pierrat is a single cross-section of the substrate. A whole substrate comprises a plurality of cross-section wherein the plurality of patterns in these Figures

are repeatable. Thus, the examiner maintains that Pierrat discloses a step of etching a second sub-layer situated under a first sub-layer comprising several defects.

***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571)272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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